

In the Title

Kindly replace the Title with the following:

**METHOD AND DEVICE FOR DETECTING THE FORMATION AND DEVELOPMENT OF
MICROORGANISM BIOFILMS IN A LIQUID CULTURE MEDIUM**

In the Specification

Kindly amend paragraphs [0007] and [0008] with the following:

[0007] The majority of microorganisms (pathogenic or non-pathogenic) have been studied up to the present in their “~~planetonie~~” “planktonic” form, free and isolated in a medium (cultivated in suspension or on a selective medium). In a natural medium outside of the laboratory the bacterial populations are found fixed on the support (“sessile” state) and developed in an organized community called a “biofilm”. This bacterial community is generally enclosed in a matrix of exopolysaccharides (EPS) limiting exchanges with the surrounding medium (A. Filloux, I. Vallet. Biofilm: “Mise en place and organisation d’une communauté bactérienne” (“Placing and Organization of a Bacterial Community”).) *Medicine/Sciences* 2003; 19: 77-83).

[0008] When a biofilm develops there is at first an adhesion of the bacteria on a support, then colonization of this support. When the bacteria multiply they rapidly form a film constituted of strata of cellular bodies secreting a sheath of exopolysaccharides that protects them against aggressions of the surrounding medium (Costerton et al. *Bacterial Biofilms. Sciences* 1999; 284-6). The kinetics of the formation of a biofilm can be subdivided into 5 stages:

Conditioning of the surface: The organic or mineral molecules present in the liquid phase will be absorbed on the surface in order to form a “conditioning film”.

Adherence or reversible adhesion: The microorganisms present approach the surfaces by gravimetry, Brownian movements or by chemotaxis if they possess ~~flagellae~~ flagella. During the course of this first fixation stage, causing only purely physical phenomena and weak physico-chemical interactions to occur, the microorganisms can still be readily detached.

Adhesion: This slower stage caused interactions with stronger energy to occur as well as the microbial metabolism and the cellular appendages of the microorganism (flagellae, pili, etc.). Adhesion is an active and specific phenomenon. The first colonizers will attach themselves in an irreversible manner to the surface in particular by the synthesis of exopolysaccharides. This process is relatively slow and is a function of environmental factors and of the microorganisms present.

The maturation of the biofilm (development and colonization of the surface): After having adhered to a surface the bacteria multiply and regroup in order to form microcolonies surrounded by polymers. The matrix of polymers (or glycocalyx) will act

like a “cement” and reinforce the association of the bacteria among themselves and with the surface in order to finally form a biofilm and attain a state of equilibrium. The biofilm generally develops in a tri-dimensional structure that constitutes a confinement site. This microenvironment will be the seat of numerous physiological and molecular modifications relative to the planktonic growth mode. The biofilm formed in this manner will occupy all the surface that is offered to it if the conditions permit it to do so. The maturation of the biofilm is generally correlated with the production of EPS even if certain species of microorganisms do not synthesize or if only few polymers can likewise adhere and form biofilms on the surfaces.

Detachment: Biofilms are structures in perpetual dynamic equilibrium and develop as a function of the support, of the microorganisms and of the environment this development can be expressed by the detachments of cells or of aggregates.